

REMARKS

The application includes claims 1-24 prior to entering this amendment.

The examiner objected to claim 1 for informalities.

The examiner rejected claims 23 and 24 under 35 U.S.C. §102(b) as being anticipated by Chang, et al. (U.S. Patent No. 5,745,747).

The examiner rejected claims 1-2, 4-6, and 8-21 (sic) under 35 U.S.C. §103(a) as being unpatentable over Chang as applied to claims 23 and 24 above, in view of Nitta, et al. (U.S. Patent No. 5,287,521). The applicants point out that the examiner did not mention claim 22 in the summary of this rejection¹, but claim 22 was grouped with claim 9 in the specific rejection of claim 9². The applicants herein assume that the summary was intended to include claim 22.

The examiner rejected claims 3 and 7 under 35 U.S.C. §103(a) as being unpatentable over Chang as applied to claims 23 and 24 above, in view of Beardsley, et al. (U.S. Patent No. 5,497,483).

The applicants amend claims 1-2, 4, 6, 9-10, 14, 18, 20, and 22-23.

The application remains with claims 1-24 after entering this amendment.

The applicants add no new matter and request reconsideration in view of the following remarks. The applicants point out that the claimed subject matter may be patentably distinguished from the cited reference(s) for multiple reasons; however, the following remarks are believed to be sufficient. Likewise, it is noted that the applicants' failure to comment directly upon any of the positions asserted by the Examiner in the office action does not indicate agreement or acquiescence with those asserted positions.

Claim Objections

The examiner objected to claim 1 for informalities. The applicants thank Examiner Pyo for pointing out the lack of indicating the deletion of the word "that" in a prior amendment. The applicants have accordingly re-inserted the word "that" in the proper place in claim 1, and have indicated its deletion by strike-through. The applicants believe that this resolves this objection.

¹ Office Action, #9 on page 5.

² Office Action, page 8.

Claim Rejections - 35 U.S.C. §102

The examiner rejected claims 23 and 24 as being anticipated by Chang.

With regard to claim 23, the examiner alleges:

B). assigning a first set of multiple locks to a first set of data items (i.e., LRBs ahead of the current LRB) accessed by the first group of database access instructions, the multiple locks assigned to different ones of the first set of data items (i.e., each lockable resource) according to the first subgroup of database access instructions, as the lock manager maintains a separate queue of lock requests for each lockable resource (Chang: col. 3, lns. 27-36 and 53-62; col. 4, lns. 11-19);

C). identifying a second subset of multiple different data items (i.e., current LRB) from the first set of data items according to the first group of database access instructions, as the lock manager checks to see if there are any LRBs in a wait state in the queue which are ahead of the current LRB (Chang: col. 3, lns. 53-col. 4, lns. 10);³

The examiner appears to be reading the applicants' "data items" onto Chang's Lock Request Blocks (LRBs) within a single queue ("LRBs ahead of the current LRB" only makes sense within a single queue of Chang's LRBs). Respectfully, this reading is not correct. Regarding Chang's LRBs, Chang teaches:

When the lock manager receives a lock request, it allocates a lock request block (LRB) for the request and stores it in the queue associated with the requested resource.⁴

That is, in Chang, the queue of LRBs is associated with a single (lockable) resource, and the single resource has but a single lock. Chang teaches that the LRBs in the queue are requests for the single resource lock:

The lock manager maintains a separate queue of lock requests for each lockable resource.⁵

Thus, it is not proper to read the LRBs "ahead of the current LRB" onto the applicants' "first set of data items" as this reading does not support "assigning a first set of multiple locks to a first set of multiple different data items" as recited in the applicants' claim 23 (emphasis added). The applicants note that Chang's LRBs are not themselves taught to be locked or lockable (but instead, are requests for locks), and that Chang teaches assigning the LRBs to a lockable resource (and does not teaching "assigning a first set of multiple locks" to the LRBs).

Further, the examiner has not provided a clear reading for the "multiple locks" that are "assigned to different ones of the first set of data items." (By referencing "LRBs ahead of the current LRB," all the LRBs are associated with a single lockable resource, since all the LRBs

³ Office Action, page 3.

⁴ Chang, col. 3, lines 29-32.

referred to are in the same queue.) Chang can only anticipate the applicant's claim 23 if Chang teaches every element of the claim (MPEP 2131). Without a clear reading of the applicants' "multiple locks" onto Chang, the 102 rejection over Chang is not proper.

Claim 23 further recites (emphasis added):

releasing the entire second set of multiple locks via a single request to release all locks associated with the second activity identifier only when all of the operations for the second group of database access instructions have completed modification of the second subset of multiple different data items.

The applicants point out that Chang has no teachings regarding "releasing multiple locks via a single request to release all locks associated with the second activity identifier" (emphasis added).

Chang does have teachings regarding commit or rollback:

When a transaction commits or rolls back, the lock manager uses the transaction ID to release all locks belonging to the transaction.⁶

But this teaching of Chang applies to "all locks belonging to the transaction,"⁷ and not just to the locks "associated with the second activity identifier" as recited in the applicants' claim 23.

Accordingly, Chang does not teach every element of claim 23, and claim 23 is in condition for the examiner's allowance for at least this reason.

As dependent claims 24 incorporates all of the elements of independent claim 23, and as independent claim 23 is allowable per the remarks above, dependent claims 24 is in condition for the examiner's allowance for at least this reason.

Claim Rejections - 35 U.S.C. §103

The examiner rejected claims 1-2, 4-6, and 8-22 as being unpatentable over Chang in view of Nitta.

The examiner rejected claims 3 and 7 as being unpatentable over Chang in view of Beardsley.

⁵ Chang, col. 3, lines 27-29.

⁶ Chang, col. 4, lines 38-40.

⁷ Chang, col. 4, lines 39-40.

Regarding claim 1, the examiner alleges:

B). for each different subgroup of program instructions, initiate a different associated subgroup of multiple different read and/or write actions (i.e., commit or rollback the changes) that access on an associated group of multiple different data items, as to the lock manager allocates and places a lock request block [LRB] in the queue (Chang: col. 3, lns. 19-36);⁸

In this portion of the rejection, the examiner appears to be reading the “associated group of multiple different data items” on Chang’s Lock Request Blocks (LRBs). This reading of the “associated group of multiple different data items,” however, is incompatible with the reading of other parts of the applicants’ claim 1. Chang teaches:

When the lock manager receives a lock request, it allocates a lock request block (LRB) for the request and stores it in the queue associated with the requested resource.⁹

In Chang, LRBs are a control structure related to the locking of a single resource, and there is no teaching or suggestion that the LRBs are themselves locked. The applicants’ claim 1 recites (emphasis added):

maintain, for each of the different activities, multiple different locks on all of the multiple different data items associated with the activity and then release all of the multiple different locks for all of the multiple different data items associated with the activity together only when all of the subgroup of program instructions associated with the activity are completed so that all of the multiple different locks on all of the multiple different data items associated with the activity have a same lock duration;

Clearly, the “multiple different data items” recited in claim 1 cannot be LRBs, as there are “multiple different locks on all of the multiple different data items.”

Further regarding claim 1, the examiner alleges:

C). use and assign only one single separate lock duration (i.e., shared ID) for all of the multiple different data items associated with each different subgroup of program instructions associated with each of the different activities (i.e., one or more different process IDs), as the shared ID field contains a unique value identifying the lock (Chang: col. 3, lns. 37-52);¹⁰

But a “shared ID” is not in any way similar to a “lock duration.” As Chang teaches:

The shared ID field contains a unique value identifying the lock.¹¹

⁸ Office Action, page 6.

⁹ Chang, col. 3, lines 29-32.

¹⁰ Office Action, page 6.

¹¹ Chang, col. 3, lines 45-46.

Whereas a “lock duration” is clearly related to time, for example to a time span. Further, the applicants' claim 1 recites “one single separate lock duration for all of the multiple different data items,” and this is clearly different from Chang's shared ID which is “a unique value” for each lock. (This reading onto Chang’s “shared ID” may be related to the misreading of the “multiple data items” onto the LRBs, since all of Chang’s LRBs for a single lockable resource would have a same shared ID, but as explained above, the “multiple data items” do not read on Chang’s LRBs.)

The applicants further point out that the claim 1 recites:

associate multiple different activities with a same transaction, each of the multiple different activities each consisting of a separate different associated subgroup of program instructions for the same transaction,

...

use and assign, for each of the different activities, only one single separate lock duration for all of the multiple different data items associated with the different associated subgroup of program instructions;

The applicants note that even if one were to read the applicants “multiple different activities” on Chang's processes (as the examiner alleges¹²), there are no teachings or suggestions in either Chang or in Nitta alone or in combination of a “only one single separate lock duration for all of the multiple different data items” “for each of the different activities” and where the “multiple different activities” are associated “with a same transaction” as recited in claim 1 (emphasis added).

The rejection further relies on Nitta. With regard to Nitta, the examiner alleges:

E). release all of the locks on a first set of multiple different data items associated with a first activity of the transaction while a second set of data items that include at least some of the first set of data items from the first activity (i.e., the shared mode lock simultaneously obtain the exclusive mode lock), but that are associated with a second activity for the same transaction, remain locked for a second separate single lock duration associated with a second activity, as a typical conversion from the share mode lock into the exclusive lock mode (Nitta: col. 14, lns. 41-59).¹³

The “shared mode lock simultaneously obtain the exclusive mode lock” and the “conversion ... into the exclusive lock mode” referred to from Nitta are only disclosed with respect to a single lock, and only affect the mode of that single lock. As Nitta teaches:

As discussed in detail, the present invention is designed to provide a two-mode lock, that is, an exclusive mode and a shared mode locks in the serialization of access to the shared mode

¹² Office Action, page 5.

¹³ Office Action, page 7.

data list among the processes being concurrently processed, release the shared mode lock and simultaneously obtain the exclusive mode lock if no process obtains a lock as a result of releasing the shared mode lock.¹⁴

That is, in Nitta, a lock can be released from shared mode and converted to exclusive mode by a current process owning the shared lock (*if no intervening process was able to grab the shared lock in the interim*). There are thus cases in Nitta where the conversion fails (and the lock is temporarily lost, at least for the process performing the conversion). (See Fig. 1 of Nitta.) In Nitta, the “conversion” appears to happen for an arbitrary process, and only if no intervening processes acquire the shared version of the lock during the conversion. This seeming randomness as to which process acquires the exclusive lock is acceptable in Nitta’s teachings, because the exclusive lock is only used for a clean-up operation (removing deleted items from the list), and this clean-up is not critical.

The applicants’ claim 1 recites:

release all of the locks on a first one of the groups of the multiple different data items associated with a first one of the different activities of the same transaction while a second set of data items that include at least some of the first group of data items from the first activity, but that are associated with a second one of the different activities for the same transaction, remain locked for a second one of the separate lock durations associated with the second activity.

Converting a single lock from one mode to another as disclosed in Nitta does not teach or suggest the applicants’ claim 1 in which “locks on a first one of the groups of the multiple different data items associated with a first one of the different activities of the same transaction” are released, and despite this release, “a second set of data items that include at least some of the first group of data items from the first activity, but that are associated with a second one of the different activities for the same transaction, remain locked for a second one of the separate lock durations associated with the second activity” (emphasis added). This is not compatible with Nitta’s teachings regarding “conversion” as those teachings cannot guarantee that the conversion is immediately successful or for which process the conversion happens.

Accordingly, as Chang and Nitta, either alone or in combination, do not teach or suggest all of the elements recited in claim 1, claim 1 is in condition for the examiner’s allowance for at least this reason.

¹⁴ Nitta, col. 14, lines 41-48.
AMENDMENT

Regarding claim 5, claim 5 is rejected for the same reasons as claim 1. The final element of claim 5 recites:

releasing all of the multiple different locks for all of the multiple different data items associated with the same activities together only when the entire subgroup of program instructions associated with the same activities are all completed.

This is not the same (or even substantially the same) as the final element of claim 1, and accordingly the rejection (which uses the wording of claim 1) does not appear to apply to claim 5. The rejection alleged:

E). release all of the locks on a first set of multiple different data items associated with a first activity of the transaction while a second set of data items that include at least some of the first set of data items from the first activity (i.e., the shared mode lock simultaneously obtain the exclusive mode lock), but that are associated with a second activity for the same transaction, remain locked for a second separate single lock duration associated with a second activity, as a typical conversion from the share mode lock into the exclusive lock mode (Nitta: col. 14, lns. 41-59).¹⁵

As can be seen, claim 5 does not recite “a first set of multiple different data items associated with a first activity of the transaction while a second set of data items that include at least some of the first set of data items from the first activity, but that are associated with a second activity for the same transaction, remain locked” as in the rejection, and accordingly the rejection of claim 5 is inapplicable.

The applicants point out that claim 5 is not taught or suggested by Chang and Nitta, either alone or in combination, for at least the following reasons. Claim 5 recites (emphasis added):

associating multiple different activities with a same transaction, each of the activities consisting of a different associated subgroup of program instructions for the same transaction and each different subgroup of program instructions initiating a different associated subgroup of read and/or write actions accessing an associated group of multiple different data items;

associating and using a single separate individual lock duration for each different subgroup of program instructions and the accessed multiple different data items associated with the same activities in the same transaction;

¹⁵ Office Action, page 7.
AMENDMENT

maintaining multiple different locks on all of the multiple different data items for each different subgroup of program instructions associated with the same activities;

Claim 5 includes “multiple different activities with a same transaction,” “associating and using a single separate individual lock duration for each different subgroup of program instructions and the accessed multiple different data items associated with the same activities in the same transaction,” and “maintaining multiple different locks on all of the multiple different data items for each different subgroup of program instructions associated with the same activities.”

Even if one were to improperly read the applicants activities on Chang's processes, there is no teaching or suggestion in Chang or Nitta, either alone or in combination, that “multiple different locks ... for each different subgroup of program instructions associated with the same activities” are associated with or use “a single separate individual lock duration.” The locks in the cited portions of Chang and Nitta are all individual, and there is no teaching or suggestion of commonality among multiple locks.

Accordingly, as neither Chang nor Nitta alone or in combination teach or suggest all of the elements of the applicants' claim 5, claim 5 is in condition for the examiner's allowance for at least this reason.

Regarding claim 10, claim 10 recites:

the processor further configured, for each of the assigned activity identifiers, to assign multiple locks to the multiple data items corresponding with the operations performed on the multiple data items pursuant to the database access instructions associated with the assigned activity identifier, and further configured to only release the multiple locks on the multiple data items when all of the operations are completed for all of the database access instructions assigned to the assigned activity identifier, and wherein the release of the multiple locks is in response to a single request via the assigned activity identifier.

As claim 10 includes at least some of the same elements as one or more of claims 1, 5, and 23, claim 10 is in condition for the examiner's allowance for at least some of the same reasons.

Regarding claim 14, claim 14 recites:

releasing, for each of the assigned activity identifiers, all of the multiple locks on all of the multiple different data items assigned to the assigned activity identifier at the same time when all of the multiple operations are completed for the subgroup of database access instructions assigned to the assigned activity identifier, and wherein the releasing of all of the multiple locks is in response to a single request via the assigned activity identifier.

As claim 14 includes at least some of the same elements as one or more of claims 1, 5, and 23, claim 14 is in condition for the examiner's allowance for at least some of the same reasons.

Regarding claim 18, claim 18 recites:

means for associating separate sets of locks with each of the different activities in the transaction;

means for maintaining the separate sets of locks for the duration of the different activities; and

means for releasing, for each of the different activities, the separate sets of locks on the associated group of multiple different data items at the same time when the associated subgroups of program instructions is complete.

As claim 18 includes at least some of the same elements as one or more of claims 1, 5, and 23, claim 18 is in condition for the examiner's allowance for at least some of the same reasons.

As dependent claims 2-4, 6-9, 11-13, 15-17, and 19-22 incorporate all of the elements of their respective independent claim, and as the independent claims are allowable per the remarks above, dependent claims 2-4, 6-9, 11-13, 15-17, and 19-22 are in condition for the examiner's allowance for at least this reason.

CONCLUSION

For the foregoing reasons, the applicants request reconsideration and allowance of claims 1-24. The applicants encourage the examiner to telephone the undersigned if it appears that an interview would be helpful in advancing the case.

Customer No. 73552

Respectfully submitted,

STOLOWITZ FORD COWGER LLP

A handwritten signature in dark ink, appearing to read "Stephen S. Ford", is written over a horizontal line.

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